

**ABSTRACT**

A method and apparatus are disclosed for coupling a multimode laser to a multimode fiber using a multimode tapered structure. The disclosed multimode tapered structure accepts an optical beam having a highly elliptical beam shape and converts the optical beam for acceptance by the circular multimode optical fiber. According to one aspect of the invention, the multimode tapered structure has a tapered form having an elliptical cross section at one end to match the rectangular laser aperture, and a circular cross section at the other end to match the fiber core. The disclosed multimode tapered structure is tapered from a smaller dimension at the input end that matches the dimension of the multimode light source to a larger dimension at the output end that matches the circular core of the multimode fiber. Depending on the selection of the numerical aperture and the length of the multimode tapered structure, coupling efficiencies up to 98 percent may be achieved with the present invention.

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